MINUTES
of the
WATER AND NATURAL RESOURCES COMMITTEE

September 18-19, 2003
Elephant Butte

The September 18, 2003 meeting of the Water and Natural Resources Committee was called to order by Senator Carlos R. Cisneros, chair, at 10:05 a.m. at the Quality Inn in Elephant Butte.

PRESENT
Sen. Carlos R. Cisneros, Chair
Rep. Joe M Stell, Vice Chair
Sen. Sue Wilson Beffort
Sen. Dede Feldman
Sen. Mary Jane M. Garcia
Rep. Dona G. Irwin
Rep. Larry A. Larranaga (September 18)
Rep. Andy Nunez
Sen. Mary Kay Papen
Rep. Henry Kiki Saavedra
Rep. Don Tripp
Rep. Robert White

ABSENT
Sen. Joseph J. Carraro
Rep. Joseph Cervantes
Rep. James Roger Madalena
Rep. Brian K. Moore
Sen. Shannon Robinson
Sen. H. Diane Snyder

Advisory Members
Rep. Rhonda S. King
Rep. Danice Picraux
Sen. Leonard Lee Rawson
Rep. Mimi Stewart (September 18)
Sen. Leonard Tsosie (September 19)

Rep. Ray Begaye
Rep. Anna M. Crook
Sen. Clinton D. Harden, Jr.
Sen. Timothy Z. Jennings
Sen. Gay G. Kernan
Sen. Steve Komadina
Rep. Ben Lujan
Sen. Nancy Rodriguez
Rep. Eric A. Youngberg

(Attendance dates are noted for those not present for the entire meeting.)

Staff
Gordon Meeks
Amy Camille Chavez

Guests
The guest list is in the meeting file.

Thursday, September 18

WATER RIGHTS ADJUDICATIONS AND HYDROGRAPHIC SURVEYS

Judge Gerald Valentine, State Engineer John D'Antonio and general counsel of the Office of the State Engineer (SEO) D.L. Sanders discussed the issue of improving the courts' water rights adjudication. Some states, like Colorado, have water courts, Judge Valentine informed the committee, but he said that water courts are not really separate from the existing judiciary. He believes that a judge should instead be appointed in each district to be trained in water law and to preside over water law cases. Stream adjudications that are interrelated might have impacts on other parts of the stream system. He said New Mexico does not really want to do the same thing that Colorado did, which was to give the courts much of the administrative authority that the state engineer now has.

Judge Valentine cited Article 4, Section 34 of the Constitution of New Mexico, which places constraints on any statutory changes that might have the objective of expediting the process. He said that stream adjudications are unique cases in the judiciary because the state engineer requires a hydrographic survey to determine who has the right to use the waters and stream system, which is a public interest. The right to use it is based on the prior appropriation doctrine, which is based on the "first in time, first in right" principle. Since the water codes were filed in 1907 for surface water rights, one must ask the state engineer for a permit. The statutes require looking at ground water and surface water together.

Judge Valentine explained that a stream adjudication process is really an inventory of the title to the right to use the water. The Supreme Court has ruled that this is a property right. A stream adjudication is the same as a deed record in the county clerk's office. If water rights are real property rights, adjudications determine who has the property rights. The adjudication results in a final decree as to who has the right to use the water.

New Mexico does not have a provision to make sure that court decrees on water rights are updated in a timely manner. Judge Valentine asserted that the problems with the Pecos River are occurring partly because the adjudications have not been updated. Institutionalization of this process might be necessary.

Questions and comments from the committee addressed:

- Native Americans' stake in the adjudication process;
- how water is apportioned among the states;
- who gets the money from electric power generated by the Elephant Butte project (the federal Bureau of Reclamation);
- House Bill 744 and the administration of water rights cases; and
- Judge Valentine's recommendation AGAINST adopting the Colorado water court model because it inappropriately places administrative duties of the SEO in the courts, which could be a violation of the separation of powers. He further explained

that water issues come before certain judges infrequently and it is better to assign specific judges the responsibility to hear water disputes — this is less expensive than setting up a separate water court.

Mr. Sanders discussed the water rights adjudication process from the perspective of the SEO. Despite ongoing concern that the adjudication process is not moving fast enough, there are thousands of parties involved, and adjudications are moving ahead expeditiously. He explained that the backlog of cases at the SEO occurs due to staffing water rights applications. The value of water rights has increased the number of transactions, yet the number of staff remains the same.

He described how the Rio Grande Compact determines New Mexico's limited supply of water. In wet periods when there is plenty of water, there is no problem, but problems occur in drought periods. Adjudications are required by state law in order to allocate wet water during those drought periods.

All western states' water laws are based on the doctrine of prior appropriation, i.e. first in time, first in right to the water. New Mexico is unique among western states, however, in that the standard for recognition of water rights is "beneficial use" — that is to say that a right is available to a user only so long as the user actually puts the water to beneficial use. The right is abandoned or forfeited if structures for diversion and delivery of water for a beneficial use are not present or the water is not used for a period of time.

He said that the state constitution recognizes prior and existing rights as they were exercised in 1912. Prior to 1912, there was no permitting process and, therefore, documentation of the existing rights at that time presents a dilemma. He also explained that the Treaty of Guadalupe Hidalgo (also part of the state constitution) calls for the recognition of Indian water rights. The order of seniority then puts the pueblos and tribes first. Second in priority would be Spanish and Mexican period acequias. The third-in-priority claimant is the Bureau of Reclamation, which made a claim of all of the unappropriated water as of 1906 in the Rio Grande and the Pecos River. There are very few surface rights recognized after 1912.

Mr. Sanders said that the SEO's mission is to distribute the water to meet as many needs as possible. Improvements in administrative technology make the office more efficient in this mission. Aerial photography of land, global positioning systems (satellite telemetry) and geographic information systems are such technologies.

In explaining the adjudication procedures, Mr. Sanders said that 50 to 60 percent of the plaintiffs accept the state engineer's initial offers of settlement because the hydrographic surveys using these technologies accurately document the water use of water rights users. He said that less than five percent of those who appeal the state engineer's settlement offer can actually demonstrate that the state engineer's surveys were inaccurate.

Because municipalities and domestic water utilities are for the most part junior water rights holders, priority administration poses a dilemma for the state engineer and for those domestic water users. It would be difficult and politically volatile to shut down water for cities in favor of agriculture. But that is what a strict interpretation of the state constitution and state law might require. For that reason, the SEO attempts to avoid priority administration and tries to meet as many needs as possible.

Questions and comments from committee members dealt with:

- sources of water rights to comply with the Endangered Species Act of 1973 or other federal laws;
- when and where the state engineer anticipates that priority administration will be conducted;
- the regulatory process to implement priority administration;
- areas that are going into shortage sharing (Rio Grande, Chama, Animas, Gila, San Juan River, Canadian Basin and Mora area);
- temporary leasing as a method to allocate water;
- proportionate water use as the basis for water shortage sharing;
- municipalities' exercise of eminent domain rights to continue to supply drinking water to cities;
- an expedited transfer process using the water market and water banking;
- the percent of water that belongs to Native Americans and each of the other major categories;
- the state engineer's authority to prevent excessive water use;
- metering of water use and request for a water use report;
- how to determine Indian water rights and basing those rights on beneficial use;
- the Bureau of Reclamation's current rights with respect to the act;
- Native American water rights being subject to forfeiture for nonuse; and
- court jurisdiction for Native American claims (federal district courts).

Mark Fesmire, chief of the hydrographic survey section in the SEO, stated that the Hydrographic Survey Bureau brings the discernible elements of a water right before a court for examination and adjudication. The survey effort determines beneficial use of a water right, the priority date of the water right and conveyance method for the water right. New Mexico does not condone use that is not part of a beneficial use. The bureau must tell the court how much water is being used. The process to do this is through a hydrographic survey. Based on that survey, an "offer of settlement" is made by the state engineer to a water right claimant. The claimant can either accept that offer, negotiate for a counteroffer or appeal. The court then, by decree, turns a claim into an adjudicated water right based upon the survey and any other "evidence" the court wishes to base its decision upon.

Mr. Fesmire presented a chart that shows the anatomy of a hydrographic survey. The steps in a hydrographic survey include information collecting and planning, field data collection,

owner interviews, information processing, publication and release and litigation. Mr. Fesmire stated that additional staff in the information collecting and planning phase can reduce costs and litigation.

Dr. Dario Rodriguez-Bejarano discussed aerial imagery and mapping of hydrographic surveys. The use of computers is prevalent at the SEO. In 1996-97, every map was put into the database, which was the Geographic Information System (GIS). The SEO previously used aerial photography, but only recently started producing digital images. Those images can be processed more quickly, thus eventually speeding up the adjudication process. Mr. Rodriguez-Bejarano presented examples of digital maps and maps with infrared technology, which show where irrigation is occurring. He also provided a summary of the geo-spacial components of a hydrographic survey.

Questions and discussion addressed:

- an individual's right to know about the SEO's negotiations with other individuals within the same stream adjudication;
- the potential for junior water right holders to make claims against senior right holders;
- the use of mediation;
- the cost for hydrographic survey maps;
- cooperation and sharing of information, including United States geological surveys; and
- availability of an aerial digital map of the entire state of New Mexico.

Rick DeSimone discussed the technical needs of the SEO. Technical needs stem from the processes associated with water rights administration, hydrographic surveys and water rights adjudications. The SEO has two databases, including the Water Administration Technical Engineering Resource System (WATERS) and the Water Rights Adjudication Tracking System. The former is a web-based system that includes numbers of water rights owners. The latter has current water rights information and work products for adjudication. Data is entered for each adjudication at the beginning of a hydrographic survey. Mr. DeSimone stated that these processes should be linked to produce a seamless process that would result in an efficient method to communicate changes.

Garth Clark, GIS coordinator for the SEO, explained the process of integrating technologies and the databases. A water right file is composed of the owner, priority date, diversion amount, point of diversion, place of use and purpose of use. Abstracting is a process in which a water right expert organizes a water right file by sorting, comparing, evaluating, inputting and checking data. The next process involves imaging the water right file. The file is scanned with the use of an imaging unit. The next process involves mapping, which requires geographic information technology. The SEO is developing an enterprise geographic information system that will integrate all of the processes, including adjudication and abstracting. The new system would help analyze applicant impacts, water availability, water plans, critical

management areas and hydrographic surveys.

Questions and discussion by the committee addressed:

- whether the geographic information technology is the same technology used by the Bureau of Land Management in its mapping; and
- whether the SEO is getting approval to get information technology funding under the aegis of the state's chief information officer.

Mr. D'Antonio then summarized the presentations made by his staff and stated that much of the staff are employed as term employees. He said that he would like to convert term positions into permanent positions within three years. The adjudication portion is a component of what needs funding, but administration is also an issue in a drought climate.

He told the committee that a statewide water plan will be finalized in a town hall process in September. Members from the Water Trust Board, the Interstate Stream Commission, pueblos and county governments will participate. The SEO must be able to communicate where it is making progress with respect to the WATERS database, which must be completed in order to help prioritize adjudications. The statewide water plan will help prioritize funding.

Questions and discussion were on:

- the number of term employees that the state engineer wants to move to permanent positions (44) and the cost;
- the amount of money appropriated for regional plans; and
- the conservation component of the state water plan.

RIO GRANDE BASIN INITIATIVE

Craig Runyan, New Mexico State University (NMSU), described the Rio Grande Basin Initiative, a joint effort between NMSU and Texas A & M University. The initiative promotes efficient irrigation for water conservation in the Rio Grande Basin. The project has provided training to hundreds of irrigation managers. It examines socio-cultural issues associated with irrigation and looks at household conservation, priority rights appropriations, etc. It has established research results in drip irrigation design, made findings on habitat tolerances of the silvery minnow and is establishing data on the effects of acequias on local hydrology. Mr. Runyan provided a packet containing a progress report for the initiative.

The discussion revealed that in November of last year, significant progress was made in getting an Internet program to give planners access to a model to determine what land use and management plan they might implement to conserve water and facilitate the water planning process. In cooperation with the Middle Rio Grande Conservancy District, the initiative is attempting to determine at what level of water the silvery minnow can continue to survive.

The initiative is also examining impacts from stream flow to acequia systems. Data is showing that in-stream flow has a negative impact on the storage of ground water and has other negative effects. Mr. Runyan also presented photographs from the hydrology modeling effort. Staff of the initiative is mostly funded by soft money.

STATE CLIMATOLOGY

Ted Sammis, state climatologist, made a presentation regarding the state climatology program. The state climatologist was funded by the federal government until 1978, at which time the State of New Mexico created a state climatology position but did not fund it. The state climatologist's job is to assess the state climate's effects on the natural environment, agricultural production, land, natural resources and human health. State law originally housed the state climatologist in the New Mexico Department of Agriculture (NMDA) until the NMDA ran out of resources and eliminated the state climatologist position. Automated climate stations around the state placed by the state climatologist were taken over by the NMSU College of Agriculture and a memorandum of agreement transferred the responsibilities from the NMDA to the college. Six states have state climatologists located in state agencies. University departments employ state climatologists in other states. Mr. Sammis recommended that the latter approach be adopted by New Mexico because universities create tools for using information gathered through research to develop decisions. The state climatology program also receives several email questions regarding the New Mexico climate. The New Mexico Climate Center (NMCC) maintains the web site for the drought task force. The program also supplies information on insect development and information on water use and requirements. The SEO modeling effort depends upon information about rainfall obtained from the climatology program. The program currently processes 138 climate stations, of which 28 are maintained by the NMCC. The rest are maintained by federal agencies. However, the state obtains the data for each station. The state climatologist position will terminate unless funds are appropriated to hire a new state climatologist. The Extension Support Council from the NMDA has made funding of the state climatology program its top priority.

Questions addressed:

- the state climatologist's other duties;
- pecan tree use analysis needs for information about rainfall for water management;
- west Nile virus and drought problems making the collection of data via the state climatology program a high priority;
- whether the position should be in the NMDA or the NMSU College of Agriculture; and
- the effectiveness of cloudseeding and the state climatologist's analysis of weather modification.

The minutes from August 7 were reviewed and approved by the committee, with one amendment by Senator Feldman. The minutes were adopted by the committee upon a motion by Representative Larranaga and were seconded by Representative White.

The committee recessed at 4:00 p.m.

Friday, September 19

The meeting was reconvened at 9:10 a.m.

MEASUREMENT AND PREDICTION OF EVAPORATION LOSSES

Barbara Kimball from New Mexico EPSCoR introduced Dr. Phil King of NMSU, Dr. Julie Coonrod of the University of New Mexico and Dr. Jan Hendrickx of the New Mexico Institute of Mining and Technology.

Dr. King discussed reservoir evaporation. Much research has been conducted regarding evaporation from Elephant Butte. The evaporation occurs as a result of fluctuations of the lake's surface area. In 2001, a project sponsored by the Bureau of Reclamation and the SEO measured evaporation from the reservoir. Data was collected that showed that actual evaporation was significantly less than was shown using the conventional method of estimating total lake evaporation through the use of scaled "pan evaporation estimates". Thus, the pan evaporation is not a very good estimate of evaporation. Future research should use more reliable methods than the pan evaporation method, he concluded.

Ms. Coonrod discussed riparian evapotranspiration. That process involves water that enters the atmosphere through trees and soil. The water involved in the process is an important part of the water budget, yet it is difficult to measure. The Bosque del Apache and Sevilleta wildlife refuges have towers installed to measure evapotranspiration. Albuquerque's South Valley and cottonwood stands also had data collection devices. It was found that evapotranspiration varies with weather conditions. Evapotranspiration also changes significantly from year to year. Transpiration is directly related to rainfall.

Soil water evaporation is also being separated from the transpiration of the trees. The Bosque del Apache site is the highest transpiration site. Sevilleta is the lowest transpiration site. A different conclusion could be reached if the South Valley's site was altered with salt cedar removal. These are only point measurements, she emphasized. Evapotranspiration from the entire corridor is the relevant data that needs to be collected. When Landsat imagery is used, evapotranspiration maps can be produced. There are many more unanswered questions and long-term data is needed.

Dr. Hendrickx stated that evapotranspiration is a combination of vegetative perspiration and evaporation. Evapotranspiration converts liquid water into vapor and is the only net loss of water seen in a local hydrologic system. If water evaporates, it is lost. In a desert, it is critical to know where and when water is going into the atmosphere. If this information is available, it is possible to develop concepts for conservative water use management to prevent water loss. One measure used in California and in other irrigation projects is ground water table management. Possible ways to conserve water are to use shallow ground water irrigation and drip irrigation systems. To adopt these conservative water use strategies, the effects of these methods should be

analyzed. The conclusion of the effort is that New Mexico needs more data regarding evapotranspiration and strategies that might prevent water loss.

One way to examine the effects of evapotranspiration is to implement certain techniques, such as using ground tool measurements to determine whether satellite images are correct. Funding is needed to come up with an operational network of ground measurement sites. Chairman Cisneros suggested that the team bring in information regarding what legislation might be needed to obtain this technology.

Other questions and comments addressed:

- the effects of evapotranspiration on the bosque ecosystem;
- comparison of cottonwood water consumption to salt cedar;
- the effect of evapotranspiration on compliance with the Rio Grande Compact;
- the endorsement by Mr. Fesmire of the work under EPSCoR because the SEO would have to eventually develop this data and spend money on this research;
- thinning forests to reduce forest fires and increase ground recharge, which adds water to local supplies;
- credit pursuant to the Rio Grande Compact for losses due to evapotranspiration;
- the history of research in evapotranspiration;
- evapotranspiration from lawns and golf course turf; and
- support for replacing nonnative trees and grasses with native trees and grasses.

WATER RESOURCES MODELING

Peter Davies of Sandia National Laboratories (SNL) introduced Bob Wessely of the Middle Rio Grande Water Assembly and Ray Finley and Howard Pasell of SNL.

Mr. Wessely discussed the need to balance water use with water supply and emphasized the necessity of water planning in achieving that goal. Water planning points out what supply and demand is and what to do about shortages or surpluses. The Middle Rio Grande Regional Water Planning Project is one of 16 regional planning projects in New Mexico. The water assembly is composed of a diverse set of constituents, which includes the Mid-Region Council of Governments. The region is engaged in "deficit spending" of water. New Mexico's net deficit is 55,000 acre-feet per year. The mission of the water planning effort is to balance the water budget. The middle Rio Grande region's demand for water is probably 25 percent more than supply. The water planning effort is focused on understanding the region's role in broader issues, addressing the wet water problem first and basing the effort upon long-term averages for sustainability. It is also focused on measuring and planning for managing consumptive uses. Some actions that the effort might take to balance the water budget include:

- desalinating/importing brackish water;
- harvesting rainwater;
- modifying the weather;

- reusing pumped water;
- reducing open water evaporation;
- restoring the bosque;
- managing the watershed;
- implementing urban conservation plans;
- implementing rural conservation plans;
- adjusting water pricing;
- metering water uses;
- limiting new domestic wells;
- moderating population growth;
- establishing educational programs;
- adjudicating and enforcing water rights;
- managing new uses of water;
- protecting sensitive areas from contamination;
- centralizing wastewater treatment;
- selecting water per quality needs;
- establishing environmental water rights; and
- establishing substantial funding mechanisms.

Mr. Wessely stated that the important question is how much of each action should be considered. Variables in answering that question might include current overspending, population growth, etc. The effort has developed a collection of actions, analyzed their implications and modeled the results of collections of actions. A multi-constituency working team was also assembled to guide model development. The model can be used to understand the coupling of effects and permits the aggregation of several actions. It also permits viewing of the results in real time and facilitates sufficiency checks. Despite the usefulness of the model, however, it is only one information source. Public values, comments and technical analysis need to be compiled to craft an effective plan. Mr. Wessely concluded that there is a regional problem that needs a regional and balanced solution.

Mr. Pasell discussed cooperative modeling. There are three objectives in adopting the model:

- providing an unbiased tool for quantitative consideration and comparison of water management alternatives and scenarios;
- providing a tool for engaging policymakers, stakeholders and the public in the decision-making process; and
- providing a tool to educate the community about the interconnectedness and complexity of the water system.

The middle Rio Grande cooperative modeling occurs with the help of several entities. The primary partners in model development include SNL, the Middle Rio Grande Water Assembly, the Mid-Region Council of Governments and the Utton Transboundaries Resources

Center. The model can bring insight into the water planning process. Several scenarios can be modeled using changes in such variables as average home water use, evapotranspiration from the bosque, agriculture, reservoir operations, population growth, drought and transfers from upstream and downstream regions. It can also show the effects of residential and nonresidential conversion to low-flow appliances, xeriscaping and bosque control treatments, including elimination of nonnative species. It can map trends resulting from changes in crop types and drought. The effects of various scenarios can be measured by trends in ground water depletion, sewage return flows, pump-induced river leakage and fiscal costs. It also models the ability to meet the Rio Grande Compact balance. The model shows that by the year 2006, there will be a steady decline in the water in the aquifer. Population growth will continue to add to that trend. Mr. Davies stated that there is a need to extend the model for use in the entire Rio Grande Basin when dealing with issues like the silvery minnow and compact deliveries.

Questions dealt with:

- the definition of new uses of water;
- water metering effects;
- SNL's research on purification of saltwater for drinking water;
- desalination as a way to solve the state's problems;
- the model's availability on the Internet and the need for $50,000 to make it so;
- the intention to model the entire state;
- Los Alamos National Laboratory's (LANL's) work on this kind of model;
- the quality of the data input to the model;
- the variable pertaining to Indian water rights in this model;
- the potential for partnerships to be formed by New Mexico Tech, SNL, LANL, etc., to maximize the effectiveness of the model;
- disposition of removed brine from desalination projects;
- water plan completion; and
- balancing domestic well regulation with the needs of communities and the water plan.

ZERONET POWER PLANT WATER CONSERVATION INITIATIVE

Marc Christiansen from Public Service Company of New Mexico (PNM) discussed the ZeroNet power plant water conservation initiative. The effort has been pursuing congressional funding. ZeroNet is working on an effort to meet the cooling needs of the San Juan station. In 2002, funding was sought from the Department of Energy. Regulatory oversight by the state engineer will need to be resolved by the legislature. New technologies for more cost- effective solutions in the future will also be explored.

Dan Macuga from LANL further discussed the ZeroNet program. The goal of the program is to achieve required electric power production in New Mexico with zero net freshwater withdrawals and use capacity by 2010. The program is composed of representatives from LANL, PNM and the Electric Power Research Institute (EPRI). It also includes representatives from a technical steering committee and a stakeholder advisory group. A two-day

session was held to determine the program's focus. The following goals of the program were identified:

- policy analysis and implications;
- education and public outreach; and
- technology development.

There is a need to bring ZeroNet into the water use sectors. The program elements of ZeroNet include the following:

- degraded water use;
- integrated modeling and management scenario assessment;
- economic, risk and market mechanisms;
- efficiency, conservation, recycling and renewables;
- advanced cooling;
- land management;
- monitoring and measurement;
- policy analysis and implications; and
- education and public outreach.

There is $1.5 million identified in the federal fiscal year 2005 appropriations bill for the program. This would be "seed money". Six hundred forty thousand dollars was awarded to PNM/EPRI to investigate the economic feasibility of produced water use in power plants. ZeroNet is also working to expand the partnership to include New Mexico universities and to establish stakeholder advisory groups. ZeroNet is also attempting to establish additional programs with other laboratories in other regions and states. It is also attempting to obtain a secure and permanent funding source.

Questions and comments addressed the need for legislation for the upcoming session, and the committee agreed to send a letter to Senator Domenici supporting ZeroNet.

Representative Tripp discussed water conservation plans for power plants. Representative Tripp introduced a memorial two years ago to study water conservation issues and transmission lines. Proponents of the dry cooling industry brought recommendations. Proponents of dry cooling support it because it uses no water. Opponents think the capital cost is greater, the energy penalty is five percent less and electric bills would go up significantly. Last session, Senator Tsosie had a bill drafted that called for conservation plans to be submitted to the Public Regulation Commission (PRC). Representative Tripp had a similar bill in the house. The bill lowered the threshold for a power plant to be required to submit a conservation plan to 50 megawatts. The water conservation plan was to be reviewed by the SEO and recommendations made to the PRC. The bill also called for extra notification to the public. The bill contained no mandate of which method of cooling was required to be used. The state is going to be building additional plants and exporting more power to California, but should do that

without significant increases in freshwater consumption. Representative Tripp recommended that the committee adopt the same bill as a committee bill.

Questions and comments addressed:

- retrofitting existing power plants; and
- dry cooling plants used in conjunction with the wet systems.

The committee adjourned at 1:00 p.m.